

company among congenial friends, and in his own home he was the best of hosts. He was remarkably regular in his attendance at the meetings of the Royal Society Club, and there his appreciation of a good story and his own powers as a raconteur were always in evidence. Like most Scotsmen, he was reserved in his expression of the deeper feelings, but his sympathies were true and his friendship staunch.

C. G. KNOTT.

NOTES.

HIS MAJESTY THE KING has been pleased to approve of the following awards this year by the president and council of the Royal Society:—a Royal medal to Prof. George Chrystal, Sec.R.S. Edinburgh, for his researches in mathematics and physics, especially his recent work on seiches and free oscillations in the Scottish lakes; and a Royal medal to Dr. W. M. Bayliss, F.R.S., for his researches in physiology. The following awards have also been made:—the Copley medal to Sir George H. Darwin, K.C.B., F.R.S., for his scientific researches, especially in the domain of astronomical evolution; the Davy medal to Prof. Henry E. Armstrong, F.R.S., for his contributions to chemical science; and the Hughes medal to Mr. C. T. R. Wilson, F.R.S., for his investigations on the formation of cloud and their application to the study of electrical ions.

THE following is a list of those who have been recommended by the president and council of the Royal Society for election into the council for the year 1912 at the anniversary meeting on November 30:—*President*, Sir Archibald Geikie, K.C.B.; *treasurer*, Mr. Alfred Bray Kempe; *secretaries*, Sir Joseph Larmor and Sir John Rose Bradford, K.C.M.G.; *foreign secretary*, Sir William Crookes, O.M.; *other members of the council*, Lieut.-Colonel A. W. Alcock, C.I.E., Prof. W. H. Bragg, Sir A. H. Church, K.C.V.O., Mr. L. Fletcher, Prof. J. S. Gardiner, Mr. W. B. Hardy, Prof. M. J. M. Hill, Prof. F. S. Kipping, Mr. H. R. A. Mallock, the Duke of Northumberland, K.G., Sir Ronald Ross, K.C.B., Prof. E. Rutherford, Prof. S. P. Thompson, Prof. Sir J. J. Thomson, Mr. H. W. T. Wager, and Prof. E. T. Whittaker.

A REUTER message from Stockholm states that the Swedish Academy of Science has decided to award the Nobel prize for chemistry to Mme. Curie. Prof. W. Wien, professor of physics in the University of Würzburg, is to receive the prize for physics. The value of each prize this year is 7773l.

WE regret to see the announcement of the death of Mr. John Brown, F.R.S., of Longhurst, Dunmurry, Belfast, on November 1, at sixty-one years of age.

THE Physical Society's annual exhibition will be held on Tuesday, December 19, and will be open both in the afternoon and evening.

THE Berthelot memorial lecture of the Chemical Society will be delivered by Prof. H. B. Dixon, F.R.S., on Thursday, November 23.

THE eighty-sixth Christmas course of juvenile lectures, founded at the Royal Institution in 1826 by Michael Faraday, will be delivered this year by Dr. P. Chalmers Mitchell, F.R.S., secretary of the Zoological Society, his subject being "The Childhood of Animals."

THE death is announced of M. E. F. André, whose works in landscape gardening are widely known in the horticultural world. Among various books of which he was the

author are "L'Art des Jardins," 1879, with numerous plates and more than 500 illustrations in the text, and a volume on the bromeliaceous plants collected in Colombia, Ecuador, and Venezuela. For nearly thirty years he edited *La Revue Horticole*, which has always held a high place among botanical periodicals.

THE Royal Geological Society of Cornwall at its annual meeting on October 31 presented the Bolitho gold medal to Mr. Clement Reid, F.R.S., in recognition of the able and conscientious manner in which he had superintended, during the past ten years, the geological resurvey of the county, the final memoirs of which are in the press. Mr. Reid, in returning thanks, said that the work done has widened the horizon and opened up new possibilities for Cornish geologists; but there is still a great deal to be done.

THE Royal Society of Arts will begin its 158th session on Wednesday, November 15, with an address from Lord Sanderson, G.C.B., the chairman of the council. Five meetings are announced before Christmas, at which papers will be read on the industrial progress of America, by Prof. James Douglas; the efficiency of the aeroplane, by Mr. A. E. Berriman; British Guiana, by Mr. J. A. J. de Villiers; London transport, by Mr. W. Yorath Lewis; and Bengal fisheries, by Dr. J. Travers Jenkins. Four Cantor lectures on "The Carbonisation of Coal" will be delivered by Prof. Vivian Lewes, and two juvenile lectures on "Soap Bubbles" will be given in January by Mr. C. V. Boys, F.R.S. A long list of papers for the meetings to be held after Christmas is also published.

THE winter session of the British Fire Prevention Committee was commenced on November 1 with a meeting to conduct a series of fire tests dealing with a small hand extinguisher intended to put out electrical and petrol fires. There was a large attendance at the committee's Regent's Park Testing Station, the Earl of Lonsborough, K.C.V.O., Mr. Alexander Siemens, and Mr. Edwin O. Sachs, members of council, receiving the visitors, among whom were leading officials concerned in fire matters from the War Office, Board of Trade, and other public departments. There will be another series of tests this month dealing with the flannelette question, which is of such importance to child life; and in December some fire-resisting doors and partitions from the United States will be under investigation.

AUTHENTIC details of the recent Wright gliding experiments are now to hand, from which it appears that the machine used was very similar to a recent type of Wright aeroplane with power. The glider had no front elevator, but an elevating tail placed 12 feet in the rear of the trailing edge of the main planes. The dimensions of the main planes were 32 feet by 5 feet respectively, with a smaller camber than that used in the powered machine. Otherwise the only alterations made were to increase the size of the vertical rudder in the rear and to cut down the length of the skids. With this glider Mr. Orville Wright, starting from one of the sand-hills near Kill Devil Hill, twice succeeded in remaining in the air for rather more than 1m. 25s. The height of the hill from which he started was 75 feet. With regard to the automatic stability device which is stated to have been tried, no details are yet available. The objects of the gliding trials were to decrease the head-resistance of the machine, and incidentally to solve in a practical manner several problems in wind pressure.

By the death, at the age of seventy-one, of Mr. W. Irvine, a retired member of the Indian Civil Service,

Oriental studies in this country have suffered a grievous loss. Mr. Irvine during a long and distinguished service in India acquired a singularly wide knowledge of the vernacular languages and of Persian. He was one of the few scholars who devoted himself to the history of the later Mogul period. His published work largely consisted of papers contributed to the *Journal of the Royal Asiatic Society* and other periodicals devoted to Oriental learning. These displayed his wide acquirements in history and philology, and his generous sympathy with India and her people. His more important works were an elaborate account of the armies of the Moguls, and an admirable edition of the famous "*Storia do Mogor*," or Mogul India between 1653 and 1708, the record of his journeys and experiences by the Venetian traveller, Niccolao Manucci, which was published in four volumes in the Indian Text Series.

THE protest recently made by Lord Curzon against the action of the Indian Government in proposing the suppression of the Central Department of Archaeology was strongly supported in these columns and by the numerous scientific bodies and individuals in this country who are interested in the preservation of historical monuments and the excavation of ancient sites. In addition, it has been shown conclusively that the work of the department had commended itself to the native princes and to all classes of the population who look back with pride upon the splendid buildings—the work of vanished races and dynasties. In the course of the debate on the subject, raised by a motion from Lord Curzon on November 3, the Secretary of State, the Marquess of Crewe, announced that while the Government agreed with the contention of the Government of India that the proposed reorganisation would not necessarily put an end to the work of conservation and excavation, he, as representing the Council of India, took the view "that it is necessary to retain the central department for advice, for general supervision, and for the collection of information in connection with archaeology." This satisfactory result of the controversy, for which all students of art and history are indebted to Lord Curzon, will be received with general approbation.

THE "Uto" photographic paper of Dr. J. H. Smith, which when exposed under a coloured transparency would furnish a coloured copy of the transparency, was referred to in these columns two or three years ago when it was placed on the market. For some time past it has been unobtainable; and it was known that Dr. Smith was seeking to perfect it. The Société Anonyme Utocolor of La Garenne-Colombes, Paris, is now introducing an improved paper under the name of "Utocolor-paper," which embodies the results of Dr. Smith's investigations. The new paper is stated to be much more rapid than the old, and it is free from the odour of anethol, the sensitiser previously employed. The gelatinous coating of the paper contains three dyes, red, yellow, and blue, which are bleached by exposure to light; and if a coloured light is employed, the dye, or mixture of dyes, that matches the colour of the light survives longer than the other dyes, which absorb the light, and therefore a coloured original is reproduced. The exposure necessary to copy an autochrome is about two hours of direct sunshine, or several hours of good diffused light and one hour of sunshine to finish it. Coloured light-filters are supplied, and one or both of them are placed over the frame during the exposure. They serve to absorb the ultra-violet and adjust the comparative colour intensities. The paper after exposure is desensitised, or "fixed," and the prints may then be kept

in a feebly lighted room for a considerable time without obvious change; and in the dark, as in an album, they may be regarded as practically permanent.

THE recently founded Prehistoric Society of East Anglia has issued the first instalment of its *Proceedings* for 1908-9 and 1909-10. It is mainly devoted to inquiries and speculations regarding certain types of flint implements found by the president, Dr. W. Allen Sturge, and his fellow-members. He remarks that "not only is our district of East Anglia one of the richest in the world for the older Palæolithic remains, but it is probably the richest—I might perhaps go further and say incomparably the richest—in the world in Neolithic remains." The work of such a society will be welcomed by all students of prehistoric man and his culture. Dr. Sturge's essay discusses in detail the peculiarities in the types of implements which he has discovered. These lead him to attribute to them a higher antiquity than is recognised by other authorities. At any rate this essay, which is well provided with illustrations, deserves serious attention.

DR. REDCLIFFE N. SALAMAN contributes to *The Eugenics Review* for October an interesting paper entitled "Heredity and the Jew." Of the ancient race he observes that it is unlikely that any people residing in the centre of the great highway of the Old World, as did the Jews and their neighbours, should have, at any time, maintained a biological purity as we understand it in the animal and plant world. Proceeding to discuss certain cases of mixed marriages between Jews and Gentiles, he arrives at the conclusion that "the Jewish facial type, whether it be considered to rest on a gross anatomical basis or whether it be regarded as the reflection in the facial musculature of a peculiar psychical state, is a character which is subject to the Mendelian law of heredity." The obvious criticism is that the materials are too scanty to warrant this conclusion. The paper, however, suggests an interesting field of inquiry, which the writer might with advantage study on a wider scale.

AT a recent demonstration given by Prof. A. Keith at the Royal College of Surgeons, Lincoln's Inn Fields, a series of preparations were shown which illustrate the remarkable growth changes which occur in the bodies of those suffering from acromegaly. Not only was the skeleton affected by a peculiar form of overgrowth, but so were the muscles, the viscera, the joints, the heart, and the lungs. Even the coats of the appendix were increased. Many of the features of the skeleton recalled those of Neanderthal man. The great enlargement of the ribs, sternum, and clavicles produced a thorax which had many points in common with that of the gorilla. The pituitary body was greatly enlarged. It becomes more evident, as our knowledge of acromegaly is extended, that the pituitary body has a profound influence on the growth of the body. It is generally recognised that it coordinates in some manner the growth of the skeleton and muscles, but it is becoming manifest that it also influences the other systems of the body. A great development of these bones and muscles would be useless to the individual unless there was a corresponding hypertrophy of the heart, lungs, and of the viscera connected with nutrition. The preparations added recently to the College of Surgeons Museum show that all these systems are affected. One of the preparations illustrates a very remarkable structural change. In the subject of the disease, a male, the pelvis had assumed by a process of growth all the characters of the female pelvis.

DR. F. NANSEN, G.C.V.O., lectured before the Royal Geographical Society on the Norsemen in America on November 6. The preparation of a short account of Arctic exploration had led him to review the whole of the evidence for the early voyages of the Norsemen, and resulted in views which differ considerably from those that are current. He agrees that the attainment of the shore of America by the Norsemen is certain, but maintains that the accounts of their voyages as we find them in the Icelandic sagas is at least in part legendary. Though Greenland, Helluland, Markland, and Wineland were discovered at the end of the tenth and the beginning of the eleventh centuries, the earliest written saga treating with these voyages was written between 1270 and 1300. He attributes the details of the self-grown vine and the unsown corn (or wheat) to interpolations and additions taken from earlier writings, such as those of Isidor Hispalensis from the seventh century, when writing of the Fortunate Islands in the Atlantic west of Africa. The same ideas in very similar words are seen to occur in the early Irish writings. His conclusion is that the whole narrative of the Wineland voyages is a mosaic of one feature after another gathered from east and west, among which we find many features, however, which indicate a certain knowledge of the real conditions on the north-east coast of America.

At the conclusion of an article on the habits of the Amazonian ant *Polyergus rufescens*, published in vol. xxxi., p. 695 (October), of *Biologisches Centralblatt*, Prof. C. Emery states that the foundation of a new colony of this species is doubtless due to one or more fertilised females effecting an entrance into a nest of *Formica fusca* or one of its subspecies. The intruding female, unless she be stopped by hostile workers, immediately makes her way to the domicile of the reigning queen, whom, when found, she attacks and eventually kills with her powerful mandibles. During the contest the attendant workers remain stupefied with fright, but at the death of their legitimate queen quickly receive the foreign female in her place. In the second year the new queen lays eggs, from which emerge polyergus-workers, and these eventually obtain the mastery of the nest.

THAT certain fishes, such as salmon, which ascend rivers or streams for spawning assume two, or rarely three, distinct phases has long been known; and in a recent issue (vol. vii., part v.) of *Annotationes Zoologicae Japonenses* Prof. S. Hatta shows that the same thing occurs in the lesser Japanese river-lamprey (*Lampetra mitsurikii*). Males and females of this species are readily distinguished by the much greater development of the anal fin in the latter than in the former; and as representatives of each sex are found in both a large phase, which attains a length of about 8 inches, and in a small phase, in which the length is less than half this, it is manifest that the species is dimorphic, especially as the two phases are found in one and the same stream, and do not intergrade.

A SERIES of nine associated human teeth discovered in a stratum of Mousterian age in a cave at St. Brelade's Bay, Jersey, are referred by Messrs. Keith and Knowles, in the October number of *The Journal of Anatomy and Physiology*, to the Neanderthal race. In spite of the slight degree in which the cusps are worn, the pulp-cavities of several of the teeth were found to be filled with secondary dentine. This and the size of the roots the authors regard as characteristic of Neanderthal teeth. Other primitive features are noticeable in the canine and first lower pre-

molar, which (in contrast to what obtains among modern races) is larger than the second, in consequence of having to serve as an opponent to the upper canine.

WITH the view of illustrating normal variations in form and size of chromosomes, Dr. C. E. Walker figures, in a note received as a separate abstract from *Archiv für Zellforschung* (vol. vi., part iv.), certain changes observed during the meiotic division in cells of the generative organ of Triton and Lepidosiren. Arising therefrom, the argument is formulated that if the chromosomes are the bearers of individual variations, the differences in form and size may be correlated with the fluctuating variations recognised by Darwin.

A REPORT on official investigations regarding "beech coccus," *Cryptococcus fagi*, conducted by Mr. L. A. Boodle and Mr. W. Dallimore, is published in the *Kew Bulletin* (No. 8). Personal observations were made in woods in Buckinghamshire and Berkshire. The evidence is not thoroughly conclusive, but the investigators express a definite opinion that the beech coccus is not the destructive agent as generally supposed, and implicate the two fungi *Nectria ditissima* and *Melogramma spiniferum*, both of which were universally found on the unhealthy trees. Another article in the *Bulletin*, of considerable interest to gardeners, is the note on peat-moss litter manure, in which it is stated that the material is neither true peat nor moss, and is extremely undesirable in gardens, being injurious unless it has been allowed to rot for two years at least; the injurious action is attributed to the excess of organic acids contained.

As a practicable study in the evolution of a land-form and its plant covering, Dr. L. Cockayne describes, in a contribution—of which a separate copy has been received—to the Transactions and Proceedings of the Botanical Society of Edinburgh (vol. xxiv., part iii.), the series of events which have led to the colonisation of the sub-alpine river-bed of the Rakaia, in the southern Alps of New Zealand. The climatic conditions point to an excess of rain, neutralised by insolation, frost, and high winds, while controlling edaphic factors are supplied by the porous soil and glacial water, so that the early colonists must be able to endure severe ecological changes. The first stages in colonisation are supplied by *Epilobium melanocaulon*, a plant provided with light, rapidly germinating seed, and the mat-forming *Raoulia tenuicaulis*. On situations raised above floods these are reinforced by a crustaceous lichen and other species of *Raoulia*, notably *R. Haastii*, which serves as a nidus for various less hardy colonists. A steppe association, distinguished by the presence of *Raoulia* and tussock grasses, and scrub are subsequent stages.

IN all new countries it is necessary to discover new crops in order that the system of agriculture should be diversified as much as possible, and particularly is it desirable to introduce leguminous crops. In a recent issue of *The Agricultural Journal of the Union of South Africa* experiments are reported showing that the soya bean is likely to prove advantageous wherever maize is of great importance. The crop is not only valuable in itself, but it leaves nitrogenous residues in the soil that add materially to the fertility. The seeds are rich in oil, for which there is a considerable demand by soap-makers and others, while the residue left after partial extraction of the oil furnishes useful cattle food.

As a reply to the statement, formulated in a memorandum issued by the U.S. Weather Bureau, questioning

whether it can be shown that deforestation has augmented droughts and floods, an article is published in *The Indian Forester* (September) citing data and observations to prove that forests do exercise a marked influence on the regulation and maintenance of water supplies. The evidence submitted falls under three heads. First, deforestation produces a diminution or cessation of flow in the streams; most of the examples quoted belong to this category. Testimony from Monroe, Wisconsin, affirms that in seventy years the forest region has been reduced from 83 to 6 per cent.; coincidentally, streams have dried up entirely, and mills have ceased to operate. Secondly, reforestation leads to an increased water supply. An instance from Burma is noted, according to which renewal of the forests on Popa Hill, Myingyan, has averted the periodic drying up of the streams. Thirdly, corroborative conclusions are derived from a comparison of the flow in neighbouring streams, fed in one case from protected, in the other from denuded, catchment areas.

THE Board of Agriculture issues leaflets calculated to serve a very useful purpose by giving information to farmers on such problems as plant diseases, crop management, and manures. The leaflets are short, concisely worded, and where possible illustrated. Some of the recent issues deal with bacteriosis of the potato and tomato; actinomycosis in cattle, a disease caused by the growth on the animal's tongue of the parasitic fungus *Actinomyces* coming from grasses, cereals, or the soil. Another leaflet deals with the three weed grasses *Triticum repens*, *Agrostis vulgaris*, and *Arrhenatherum avenaceum*, all described by the farmer as couch or twitch; whilst a third gives an account of the composition of seaweed and its use as manure.

THE eleventh annual report of the Midland Agricultural and Dairy College shows that the members of the staff are responding in a splendid manner to the demands made on them by students and farmers. The principal says of one of the departments: "Every use has been made of the time and facilities that are available, and often leisure that ought to have been spent in recreation has been devoted to extra work," a statement fully borne out by the separate reports from the individual members of the staff. The Board of Agriculture has increased the grant to the maximum of 1000*l.*, but more space seems to be needed in several departments. Favourable reports were sent by the examiners, except only in one instance, and there a perusal of the examination questions shows that the fault lies with neither students nor staff.

THE summary of the weather for the week ending November 4, issued by the Meteorological Office, shows that the conditions were very stormy throughout the period. Several large and important storm areas arrived from the Atlantic and extended over the British Islands and their neighbourhood. Severe gales were experienced on several days during the week, and on Saturday, November 4, the barometer at Thorshavn fell below 28.0 inches as the central area of the storm traversed Færøe. The rainfall for the week exceeded the average in all districts except in the north-east of England and in the English Channel. In the west of Scotland the measurement was 3.89 inches, which is 2.59 inches more than the average, and in the north of Scotland the excess was 2.29 inches. The aggregate rainfall for the nine weeks of the present autumn is now in excess of the average in the south-east and north-west of England, in the English Channel, and in the south of Ireland, whilst the deficiency in other districts is being

greatly lessened by the recent heavy rains. At Greenwich the rainfall for October was 3.29 inches, which is 0.44 inch more than the average of the past sixty years; and October was the wettest month since November of last year.

AMONG several useful papers in the *Journal of the Meteorological Society of Japan* for August is one, by Mr. Y. Tsuiji, on earth temperature at Taihoku (Formosa), based on eleven years' observations (1897-1907). The surface layer of the ground is clay, and underground water is met with at a depth of about 20 feet. The tables show that the average annual air temperature is 21.54° C., and at the surface of the ground 23.55°; at 0.5 metre the mean is 23.39°, at 1 metre 23.31°, at 3 metres 23.11°. The mean decreases with depth, while the rate of diminution also becomes smaller as the depth increases; the annual range diminishes with increase of depth, while the epoch of extreme temperature is retarded. The author submits the results to harmonic analysis, and remarks that they show that if we are satisfied with a rough determination of the mean values for practical use, there is no need for that laborious process adopted in modern meteorology.

IN *The Cairo Scientific Journal* for September details are given of a slight earthquake shock which was felt in Cairo on August 22 at 10h. 23m. east European time. It was characterised by the very rapid character of the vibrations.

IN *Petermann's Mitteilungen* for October the results of the census of Mexico taken in October, 1910, are discussed and presented in a map which shows the distribution of population density. The northern portion to the north of lat. 25° is scantily peopled, having a population of from one to three to the square kilometre. The most densely peopled region is in the central part by Mexico, where a small portion is shown as having 480 inhabitants per square kilometre.

We have received a catalogue of surveying and drawing instruments made by Messrs. C. F. Casella and Co., Ltd., of 11 Rochester Row, London, S.W. Besides the usual types of instruments, this firm constructs several of a special character, and full descriptions of some of these are given in the catalogue. Among these we may note Reeves's tangent micrometer for use on sextants and theodolites; Reeves's distance-finder alidade, in which the 3-foot alidade rod can be utilised as a distance finder, so that when used on a plane table the distance of objects can be determined either by intersection or by direct measurement. Hepworth's electric artificial horizon is a simple attachment by which, when a line on the horizon glass is in alignment with the eye of the observer and the natural horizon, the observer is notified by an audible signal, so that the use of the sea-horizon is no longer necessary, and observations can be taken when fog or mist may obscure the horizon.

THE *Journal of the Franklin Institute* for October contains an abstract of a paper on the rôle of water in minerals, by Dr. W. W. Coblenz, of the Bureau of Standards, Washington, which gives an account of a method of investigating the question which seems likely to furnish more definite information than has been available in the past. Dr. Coblenz examines the infra-red absorption spectra of a number of minerals having water of crystallisation by means of a vacuum bolometer and a mirror spectrometer. He finds that in some cases the absorption spectrum of the crystal is not, while in other cases it is,

the superposed spectra of the anhydrous substance and water. The water in crystals of the first class he proposes to call "water of constitution," and in the second "water of crystallisation." The latter term would thus include water which has in the past been known as "water of crystallisation," "dissolved water," and "water of solid solution."

THE diurnal variation of magnetic declination at Kiel is discussed by L. Weber and H. Borchardt in a paper in Heft 1, Bd. xv., of the *Naturwissenschaftlichen Verein* for Schleswig-Holstein. The data, derived from a magnetograph of special construction, extended—with two or three short interruptions—from January, 1902, to September, 1910. The range of the regular diurnal variation in individual months varied from 2.8' in December, 1905, to 12.8' in July, 1906; while the range of the mean diurnal inequality for the year varied from 6.63' in 1909 to 8.46' in 1905. At the end are curves showing the diurnal variation for the twelve months of the three years 1907 to 1909 treated individually, and for the twelve months of the seven years 1903 to 1909 combined, as well as the mean diurnal variation for the year from the last-mentioned period.

THE recent study of white plumage and hair coloration has led to the interesting conclusion that there are two varieties of white, one of which is dominant and the other recessive. These are indistinguishable to the eye, but exact opposites from the breeder's point of view. Dr. R. A. Gortner, working in the biochemical laboratory of the Carnegie Institution, has shown recently (*Journal of Biological Chemistry*, September) that dominant whites do not contain a melanin which is lacking in the recessive whites; he attributes dominant whites to the presence of a factor which inhibits pigment formation. His experiments prove that the oxidation of tyrosine by tyrosinase is prevented by the presence of aromatic phenols, which contain two hydroxyl groups in the meta position to each other, such as resorcinol, orcinol, or phloroglucinol. These phenols do not inhibit other oxydases than tyrosinase. It is supposed that in dominant whites such an inhibiting factor is present, whereas the recessive whites lack enzyme or chromogen or both, and also lack the inhibiting factor.

Engineering for November 3 comments on the report of the commission appointed to inquire into the cause of the *Liberté* explosion, which has now been made public. Briefly, the report states:—(1) That it was not due to an act of malevolence. (2) That it was not due to a fire having occurred in any of the spaces adjoining the magazines. (3) That it was due to the inflammation of a cartridge of service powder in one or other of the forward starboard magazines containing only powder from one lot—namely, lot BM₁₃ AM₄ 2.06 P.B.—i.e. the second lot of powder manufactured in 1906 at the Government powder factory of Pont-de-Buis. The commission hesitates to attribute the cause to "spontaneous combustion" of the powder. Among other recommendations, the report states that the recent order lowering to four years the limit of age allowed for powders stored on board will be, without doubt, for a long time yet one of the most efficacious guarantees of safety against the instability of "B" powders; in foreign navies the limit of age is even lower.

OUR contemporary points out that British cordite is tested as soon as possible after it becomes eight years old, and though inspection is made twice yearly of all cordite, it is clear that it is expected to last at least eight years. Germany and Italy both use nitro-glycerine powders

for their navies, which, so far as is known, have been immune from trouble as regards powder. Possibly the United States regulations are referred to, since the U.S. Navy use a nitro-cellulose powder—i.e. the same type as the French Navy. *Engineering* holds that the report confirms its already published views that, for naval purposes, the nitro-cellulose type of propellant powder is vastly inferior, both chemically and ballistically, as compared with the nitro-glycerine type. Indications are not wanting that the U.S. Navy may have to deplore a similar disaster, as it has lately adopted the course of "reworking" its "old" powders, some of them only a couple or so years old, with so-called stabilisers. These may have their uses when added to newly made powders; but to add them to powders which have already shown themselves to be unstable, from the fact that they are sentenced to be reworked, is a dangerous expedient which no economic consideration can excuse.

MR. W. MARTINDALE, New Cavendish Street, London, W., has issued a new complete price-list of apparatus, chemicals, and appliances generally suitable for scientific chemists and medical practitioners. The catalogue runs to 182 large pages, is well illustrated, and arranged in a form handy for reference.

MANY valuable works—old and new—are included in a catalogue of second-hand books on meteorology and terrestrial magnetism just issued by Messrs. H. Sotheran and Co., 43 Piccadilly, W. Brief notes are given describing the characters of most of the books. The catalogue includes also a collection of works on airmanship, and a supplement of cognate periodicals and publications of learned societies.

AN illustrated supplement, 1911, to the catalogue of scientific apparatus issued in 1910 by Messrs. Heynes Mathew, Ltd., of Cape Town, serves to show, incidentally, the satisfactory way in which the teaching of science is being developed in South Africa. The science teachers in South African schools are now able to obtain locally the equipment and material necessary for their work. The present list shows that this firm is in a position to undertake the complete furnishing and equipment of laboratories.

THE *Revista Tecnica del Ministerio de Obras Publicas* of Venezuela for September contains a note on the calculation of geographical coordinates and azimuths for a geodetic triangulation on which a physical and political map of the country may be based. The values for Clarke's ellipsoid of 1866 are used, and the Coast and Geodetic Survey of the United States is followed for the logarithms of the different constants involved in the computations.

AMONG notices of forthcoming scientific books which we have received during the week may be mentioned the following:—Messrs. Methuen have in the press a book by Mr. R. Lydekker, F.R.S., entitled "The Ox and its Kindred." Commencing with a discussion as to the proper English name of the domesticated animal, the author gives a sketch of the structure and zoological position of oxen, followed by a history of the extermination of the wild ox, or aurochs. Accounts are also given of park-cattle and the chief domesticated breeds of cattle—British and foreign; the book concludes with brief surveys of the wild and extinct members of the group.—Messrs. Kegan Paul, Trench, Trübner and Co., Ltd., are publishing under the title of "North Sea Fishers and Fighters" a work, by Mr. Walter Wood, on the development of the deep-sea

fisheries. The book deals fully with the men of the North Sea, and is embellished with colour and pencil drawings and photographs.—Mr. William Lewis, of Duke Street, Cardiff, is publishing for the Cardiff Naturalists' Society the first volume of "The Flora of Glamorgan," including the spermatophytes and vascular cryptogams, with index. The work has been prepared under the direction of a committee of the Cardiff Naturalists' Society, and is edited by Prof. A. H. Trow.

OUR ASTRONOMICAL COLUMN.

BROOKS'S COMET, 1911c.—In addition to the ordinary cometary spectrum, M. Bosler finds radiations at $\lambda\lambda$ 407, 405, 401, and 399 in the spectrum of the head of Brooks's comet. A longer exposure on September 25 showed also the tail radiations, and it was seen that $\lambda\lambda$ 401, 425, and 456 extended some $1^\circ 30'$ into the tail, while the radiation at λ 470 extended for not more than $30'$.

Prof. Iniguez, describing the photographs secured at the Madrid Observatory (*Comptes rendus*, No. 17, October 23), records seven condensations in the spectrum, viz. $\lambda\lambda$ 555, 514, 472, 440, 423, 410, and 388. But the fourth and sixth are multiple, the wave-lengths of their components being 440, 434 and 432 and 410, 407, 405, 404, and 402 respectively; λ 388 is double.

The comet is still visible near the horizon, south of east, just before daybreak; but, as will be seen from the following ephemeris, by Dr. Ebell, the southern declination is increasing, and the comet, receding from both sun and earth, is becoming fainter:—

Ephemeris 12h. M.T. Berlin.

1911	α (true) h. m.	δ (true) ° ' "	$\log r$	$\log \Delta$	mag.
Nov. 8	12 43'9	9 48'9	9.7531	0.0263	3.9
" 12	12 51'6	14 10'4	9.7918	0.0558	4.2
" 16	13 0'3	18 3'6	9.8317	0.0824	4.5
" 20	13 9'4	21 31'7	9.8709	0.1063	4.9

BORRELLY'S COMET, 1911e, AND WOLF'S COMET, 1911a.—A telegram from Dr. Meyermann to the *Astronomische Nachrichten* announces that Borrelly's comet was observed at Tsingtau on October 20. It was elongated, about $2'$ in diameter, magnitude 10, had no tail, and was very indistinct.

M. Kamensky gives an ephemeris, extending to January 2, 1912, for Wolf's comet in No. 4528 of the *Astronomische Nachrichten*. Only four observations of this faint object during the present return have yet been recorded; these give corrections of the order of $-0.5s.$ and $-6''$ to the ephemeris. Taking the magnitude on June 29.5 as 14.6, as determined from Dr. Wolf's plate, M. Kamensky finds that at no time this year will the comet be brighter than the fourteenth magnitude.

MARS.—M. Antoniadi's observations of Mars with the large refractor at the Meudon Observatory commenced on September 18, and a number of changes have already been noted. Modifications of the colours of various parts of the disc, with an abnormal pallor of the "seas," suggests the presence of yellowish cloud in the Martian atmosphere, such as has been noted at previous oppositions. A large mass of white cloud completely veiled the region of M. Cimmerium, M. Tyrrhenum, and Hesperia on October 14. The complete veiling of so dark an area as M. Tyrrhenum has not been seen since 1888, when the series of observations commenced. The whiteness of Libya on October 11 is attributed to overlying mist, which is transparent when viewed normally, but increases in visibility as the line of vision becomes more oblique, i.e. as the area approaches the terminator. A very bright terminator projection, probably due to cloud, was a very prominent feature of the regions north of Icaria from 10h. 56m. to 11h. 25m. on October 14; terrestrial clouds then stopped observations (*Astronomische Nachrichten*, No. 4532).

THE SUN'S ENERGY SPECTRUM AND TEMPERATURE.—In No. 3, vol. xxxiv., of *The Astrophysical Journal* Mr. NO. 2193, VOL. 88]

Abbott discusses the distribution of energy in the sun's spectrum as derived from the spectro-bolometric observations made at Mount Wilson, Mount Whitney, and Washington during 1903–10. He discusses at length the various possible errors and the conditions which might modify, more or less, the derived results. The distribution of energy outside the atmosphere is tabulated, and the energy is shown to reach a sharp maximum at about 0.470μ ; a table of atmospheric transmission coefficients is also given. The results appear to be independent of the observing station, but sensitive to the character of the spectroscope used, and little weight must be given to values for wave-lengths beyond 0.40μ where glass prisms are employed; a quartz-magnesium system was used latterly.

Mr. Abbott also discusses the question of the sun's temperature, and finds that the sun's effective emission is comparable with that of a "black body" at 6000°C. absolute, although he considers this is modified considerably, and that the actual radiating temperature is more of the order of 7000°C. absolute.

A DAYLIGHT METEOR IN SOUTH AFRICA.—Some accounts of a wonderful meteor, which provided a striking spectacle some time before noon on August 24, are recorded by Mr. Innes in Circular 11 of the Transvaal Observatory. The phenomenon was seen by several persons located near Potchefstroom; but the reports are not strictly in accordance. Mr. Innes suggests the possibility of the several observers having seen portions of a broken-up meteor of such brilliancy as to arrest their attention in full sunlight. Mr. Ingham, chief engineer of the Rand Water Board, estimates that when he saw it the meteor was not more than 400 yards distant, had a head 5 or 6 inches in diameter, and a flame, like that of burning sodium, extending some 12 to 15 feet from the head. No "find" is recorded.

THE PERIOD AND EPOCH OF 68 u HERCULIS.—In No. 4526 of the *Astronomische Nachrichten* Dr. Hertzsprung discusses the long series of observations of the variations of 68 u Herculis made by J. F. J. Schmidt during 1869–79. He finds for the period $2.051027d.$, which agrees with the spectroscopic results, and for the commencing epoch of chief minimum, taking the mean of Schmidt's and recent observations, J.D. 2410102.321 M.T. Greenwich. The period shows no apparent variation.

THE ASTRONOMICAL SOCIETY OF BARCELONA.—One of the objects of this society, upon which special stress was laid at its foundation in January, 1910, was the provision of a public observatory where members might meet on fine evenings to study celestial phenomena and to discuss points of astronomical interest. It is pleasant to record that the primary object of the promoters has been realised very unexpectedly, and without cost to the society, in such a manner that within the next few weeks the members will be in absolute possession of a well-equipped observatory. Señor Rafael Patxot y Jubert has offered to present his observatory and instruments to the society, and, needless to say, the offer has been accepted. This establishment, the Observatori Catalá, is situated at San Feliu de Guixols, in the province of Gerona, and in importance stands next to the observatories of Madrid and San Fernando. The whole establishment will be removed immediately to Barcelona, where it will be re-erected on the roof of one of the public buildings.

The instruments include a double equatorial by Mailhat, visual and photographic, with apertures of $8\frac{1}{2}$ inches and focal lengths of 10 feet and 7 feet 9 inches respectively. A complete set of accessories of precision is included in the gift—spectroscope, micrometer, camera, electric pendulum, and azimuthal theodolite. Annexed to the observatory in its new position will be a room for meetings of the society, library, photographic laboratory, &c. Preparations for the public lunar exhibition, which will be held in Barcelona in May, 1912, are being pushed forward rapidly, and already many promises of assistance have been received from all parts of the world. The exhibition will be held in the University buildings, under the honorary presidency of the rector, Baron de Bonet. The executive council of the society invites the cooperation of seleno-